

ABSTRACT OF THE DISCLOSURE

An extractor extracts a part that is apparently a bar-code signal from a signal that is subjected to opto-electric conversion. A narrow-band differential processor forms a waveform of an edge by 5 differentiating by using a module frequency. The module point extractor extracts the module point from the waveform. The maximum likelihood judgment processor 5f performs ternarizing based on a maximum likelihood method by using broader information.